Evaluation of Health IT in Implementation Science

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Adoption of EHRs in Ambulatory Settings

Adoption of EHRs in Hospitals

Adoption of CPOE in Hospitals

Source: Hospital EHR Adoption Database (Supplement to the Annual AHA Survey of Hospitals)
If You Install It, Will They Use?

- New Jersey E-Prescribe Program, Jan – June 2006
  - 293 prescribers who installed in CY 2005
  - Incentive for use up to $500/qtr

![Bar chart showing eRx Usage Ratio with percentages: 53%, 26%, 21%]
“Meaningful Use”

◆ 2011 Goal
  – electronically capture in coded format; report health information; use that information to track key clinical conditions
  – 40% of prescriptions, 30% of all orders entered electronically

◆ 2013 Goal
  – electronically capture in coded format; report health information; use that information to improve performance and support care processes

◆ 2015 Goal
  – electronically capture in coded format; report health information; use that information to improve outcomes
EMR Incentives in ARRA

◆ Direct Payment Incentives
  – Medicare: Up to $44k/physician over 5 yr if using by 2011, then penalty
    - $15,000 in 2011, then $12,000, $8,000, $4,000 and $2,000
    - Must demonstrate “Meaningful Use” of certified EHR
  – Medicaid: Cover 85% of EHR, up to $63,750 if start 2011

◆ Regional Extension Centers
  – Direct on-site technical assistance in:
    - Selecting a certified EHR product
    - Achieving effective implementation of the EHR
    - Enhancing workflows to optimally leverage the EHR
    - Complying with applicable integrity, privacy and security requirements

◆ National Coordinator for Health IT: David Blumenthal
EHR Adoption: The Latest

- Overall 40.4%
- Varies with:
  - Number of physicians
    - One-physician: 30.8%
    - 26-plus physicians: 75.5%
  - Exam rooms
    - One: 28.2%
    - 11-plus: 64.1%
- However
  - 72.6% haven’t determined a timeframe
  - 20.8% unaware of government EHR incentives

ONC-sponsored national survey
October 24, 2011
Variance in System Features

- 60 expert-panel recommendations
- 49% implemented among 10 systems

[Wang, 2005]
Shadowing for IT System Errors

- Inpatient CPOE at U. Penn: [Koppel, JAMA 2005]
  - 22 new types of errors documented in shadowing residents; these occurred frequently; e.g.:
    - One-time orders get entered as standing orders
    - Gap in antibiotics because not renewed

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Role of Computerized Physician Order Entry Systems in Facilitating Medication Errors

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Context  Hospital computerized physician order entry (CPOE) systems are widely regarded as the technical solution to medication ordering errors, the largest identified source of preventable hospital medical error. Published studies report that CPOE reduces medication errors up to 81%. Few researchers, however, have focused on the existence or types of medication errors facilitated by CPOE.

Objective  To identify and quantify the role of CPOE in facilitating prescription error risks.

Design, Setting, and Participants  We performed a qualitative and quantitative study of house staff interaction with a CPOE system at a tertiary-care teaching hos-
IT System Errors

–Koppel surveyed 95 housestaff about frequency of errors

<table>
<thead>
<tr>
<th>Error Type</th>
<th>Error Frequency During Past 3 Months, %</th>
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<tbody>
<tr>
<td></td>
<td>Never</td>
</tr>
<tr>
<td>Used CPOE to determine low dose for infrequently used medications</td>
<td>27.3</td>
</tr>
<tr>
<td>Used CPOE to determine the range of doses for infrequently used medications</td>
<td>18.5</td>
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<tr>
<td>Delayed for several hours canceling medication because of fragmented CPOE display</td>
<td>48.6</td>
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<tr>
<td>Observed a gap in antibiotic therapy because of unintended delay in reapproval of antibiotic</td>
<td>16.9</td>
</tr>
<tr>
<td>Not able to quickly tell which patients ordering for because of poor CPOE display</td>
<td>45.4</td>
</tr>
<tr>
<td>Been uncertain about patients’ medications because of multiple CPOE displays</td>
<td>28.5</td>
</tr>
<tr>
<td>Delayed ordering because CPOE system down</td>
<td>16.3</td>
</tr>
<tr>
<td>Had difficulty specifying medications and problems ordering off-formulary medications</td>
<td>8.5</td>
</tr>
</tbody>
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Table. Frequencies of Reported Medication Ordering Errors and Error Risks Involving the CPOE System (n = 261 Respondents)

Abbreviation: CPOE, computerized physician order entry.
*Generated by fragmentation of data and failure to integrate the hospital’s several computer and information systems.
†A reflection of machine rules that do not correspond to work organization or usual behaviors.